

(12) **UK Patent Application** (19) **GB** (11) **2 205 149 A** (13)  
 (43) Application published 30 Nov 1988

(21) Application No 8711158

(22) Date of filing 12 May 1987

(71) Applicant  
**The Torrington Company Limited**

(Incorporated in United Kingdom)

Torrington Avenue, Coventry, Warwickshire, CV4 9AE

(72) Inventor  
**Michael Thomas Hancock**

(74) Agent and/or Address for Service  
**Raworth Moss & Cook**  
 36 Sydenham Road, Croydon, Surrey, CR0 2EF

(51) INT CL<sup>4</sup>  
**B62D 1/18**

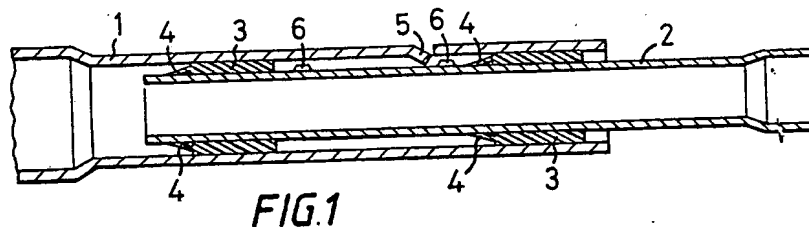
(52) Domestic classification (Edition J):  
**F2Y 3102 SQ**  
**B7B SDA**  
**U1S 1820 1850 B7B F2Y**

(56) Documents cited  
**GB A 2184213**

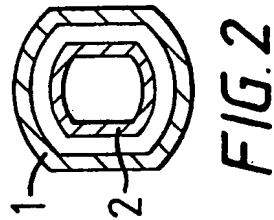
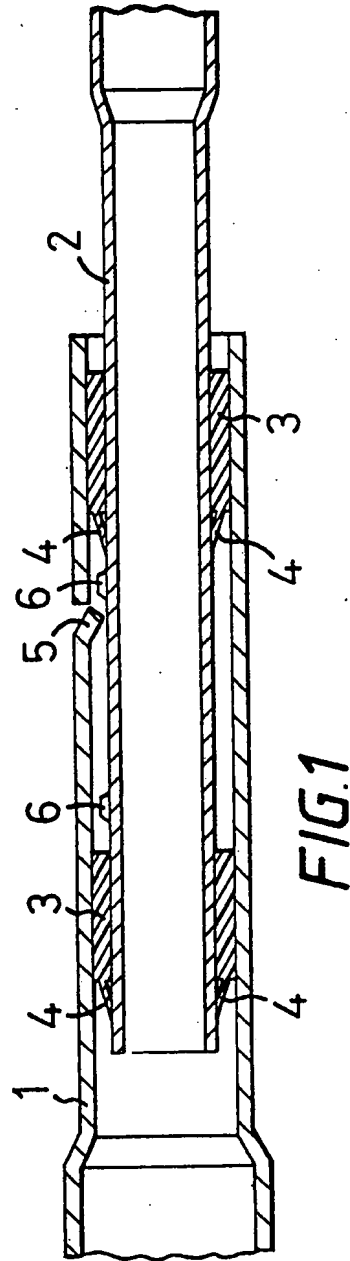
(58) Field of search  
**F2Y**  
**Selected US specifications from IPC sub-class**  
**B62D**

(54) **Improvements in or relating to steering columns**

(57) A vehicle steering column includes a tubular first part (1) in which a part (2) can slide, two bushes (3) being fitted inside the end of the part (1) and having fingers (4) which are arranged to bear on the end portion of the part (2) to take up clearance. The two parts are able to slide relatively to one another so that the driver of the vehicle can adjust the position of the steering wheel, the limits of adjustment being defined by two tangs (6) which can abut against a tag (5) formed in the part (1). The tag (5) may be arranged so as to shear when subjected to excessive force.



The drawing(s) originally filed was (were) informal and the print here reproduced is taken from a later filed formal copy.



IMPROVEMENTS IN OR RELATING TO STEERING COLUMNS

5 This invention relates to a vehicle steering column including two parts and means to enable one of the two parts to slide longitudinally relatively to the other part.

10 It is known to provide a vehicle steering column with a reach adjustment facility whereby a driver of the vehicle can adjust the position of the steering wheel in and out in the longitudinal direction of the steering column.

15 Known arrangements for such a reach adjustment are quite expensive to manufacture because of the need to machine items and/or form splines to provide a relative sliding movement between two parts of the steering column.

20 According to the present invention, there is provided a vehicle steering column including two partly concentric parts and means to enable one of the two parts to slide longitudinally relatively to the other part between a first limit position and a second limit position, a first of said parts having a tubular portion in which a  
25 portion of the second part fits and there being at least one bush in said first part surrounding said second part to facilitate relative sliding of said first and second parts.

30 Preferably, said at least one bush is fixed inside said first part so that said second part slides in the bush.

Two of said bushes can be provided, one of the bushes being spaced from the other to assist in guiding the second part in the first part. The or each bush may have resilient fingers at one end arranged to bear on a  
5 periphery of said second part to take up clearance between the first and second parts and the associated bush.

Said second part may be made from a formed tube or a  
10 solid bar. Both the first and second parts may have a flattened configuration.

The second part may be provided with at least one crimp tang and the first part may be provided with a tag  
15 against which said at least one tang can abut, either said first or said second limited position being defined when said at least one tang abuts said tag. An indentation can be provided instead of the tang, in which case the tag is long enough to extend into the  
20 indentation. The tag may be arranged to shear if the sliding force of the second part causes said at least one tang or indentation to bear on the tag with a force greater than a predetermined force.

25 For a better understanding of the invention and to show how the same may be carried into effect, reference will now be made, by way of example, to the accompanying drawing, in which:-

30 Figure 1 is a diagrammatic sectional view of part of a vehicle steering column including two parts and means to

enable one of the two parts to slide longitudinally relatively to the other part, and

5 Figure 2 shows the cross-sectional configuration of the two parts.

The drawing shows part of a vehicle steering column incorporating means to enable one part to slide relatively to another part to enable the driver to have  
10 a reach adjustment at the steering wheel.

The arrangement includes a first part 1 consisting of a tube which has been formed into a flattened configuration at least in the region of the end portion  
15 shown, and a second part 2 which also has been formed into a tube of flattened configuration at least in the end portion shown. The end portion of the part 2 is concentric with the end portion of the part 1 and is able to slide inside the illustrated end portion of the  
20 part 1 and to facilitate this two bushes 3 are provided, these bushes 3 being fixed inside the part 1 so that they cannot move relatively thereto in normal usage, each bush 3 being provided with preloaded fingers 4 which bear on the outer periphery of the part 2 in its  
25 end region thereby to take up any clearance between the described components. The bushes 3 can be moulded from a plastics material. To give the resilient effect to the fingers 4, the bushes 3 are given small, longitudinally-extending splits in their ends adjacent  
30 the fingers 4.

One of the parts can slide relatively to the other part between a first limit position and a second limit position. These limit positions are provided by a tag 5 protruding inwardly from the part 1 in its end region and two spaced-apart tangs 6 on the outer periphery of the part 2, the two tangs 6 being located between the bushes 3. It will be seen that the two limit positions, i.e. the in and out locations of the steering wheel, are defined when the tangs 6 respectively abut against the tag 5.

Under normal circumstances, the resilience of the fingers 4 of the bushes 3 is sufficient to inhibit relative sliding of the parts 1 and 2 until a force of at least 30 N is experienced. Normally, the tag 5 is not intended to take any force but nevertheless is arranged to allow passage of the tangs 6 past it should a force exceeding something of the order of 1000 N be applied.

CLAIMS:

1. A vehicle steering column including two partly concentric parts and means to enable one of the two parts to slide longitudinally relatively to the other part between a first limit position and a second limit position, a first of said parts having a tubular portion in which a portion of the second part fits and there being at least one bush in said first part surrounding said second part to facilitate relative sliding of said first and second parts.  
5
2. A steering column according to claim 1, wherein two of said bushes are provided in said first part, one bush being spaced from the other bush to assist in guiding said second part in said first part.  
15
3. A steering column according to claim 1 or 2, wherein the or each bush is fixed inside said first part so that said second part slides in the or each bush.  
20
4. A steering column according to claim 1, 2 or 3, wherein the or each bush has resilient fingers at one end thereof arranged to bear on a periphery of said second part to take up clearance between said first and second parts and the associated bush.  
25
5. A steering column according to any one of the preceding claims, wherein said second part is formed from a tube.  
30

6. A steering column according to any one of claims 1 to 4, wherein said second part is formed from a solid bar.

5 7. A steering column according to any one of the preceding claims, wherein said first and second parts have a flattened configuration.

10 8. A steering column according to any one of the preceding claims, wherein said second part is provided with at least one tang and said first part is provided with a tag against which said at least one tang can abut, either said first or said second limit position being defined when said at least one tang abuts said tag.

15 9. A steering column according to claim 8, wherein said second part is provided with a second tang which is spaced apart from said first tang, said second tang defining the other limit position when it abuts said tag.

20 10. A steering column according to claim 8 or 9, wherein said tag is arranged to shear if a sliding force of said second part causes the or one of the tangs to bear on the tag with a force greater than a predetermined force.

25 11. A steering column according to any one of the preceding claims, wherein the or each bush is moulded from a plastics material.



12. A vehicle steering column, substantially as hereinbefore described with reference to the accompanying drawing.

5

10

15

20

25

30

CLAIMS:

1. A vehicle steering column including two partly  
concentric parts and means to enable one of the two  
5 parts to slide longitudinally relatively to the other  
part between a first limit position and a second limit  
position, a first of said parts having a tubular portion  
in which a portion of the second part fits, there being  
at least one bush in said first part surrounding said  
10 second part to facilitate relative sliding of said first  
and second parts and the or each bush has resilient  
fingers at one end thereof arranged to bear on a  
periphery of said second part to take up clearance  
between said first and second parts and the associated  
15 bush.

2. A steering column according to claim 1, wherein  
two of said bushes are provided in said first part, one  
bush being spaced from the other bush to assist in  
20 guiding said second part in said first part.

3. A steering column according to claim 1 or 2,  
wherein the or each bush is fixed inside said first part  
so that said second part slides in the or each bush.  
25

4. A steering column according to claim 1, 2 or 3,  
wherein said second part is formed from a tube.  
30

5. A steering column according to claim 1, 2 or 3, wherein said second part is formed from a solid bar.

5 6. A steering column according to any one of the preceding claims, wherein said first and second parts have a flattened configuration.

10 7. A steering column according to any one of the preceding claims, wherein said second part is provided with at least one tang and said first part is provided with a tag against which said at least one tang can abut, either said first or said second limit position being defined when said at least one tang abuts said tag.

15 8. A steering column according to claim 7, wherein said second part is provided with a second tang which is spaced apart from said first tang, said second tang defining the other limit position when it abuts said tag.

20 9. A steering column according to claim 7 or 8, wherein said tag is arranged to shear if a sliding force of said second part causes the or one of the tangs to bear on the tag with a force greater than a predetermined force.

25 10. A steering column according to any one of the preceding claims, wherein the or each bush is moulded from a plastics material.

30

11. A vehicle steering column, substantially as hereinbefore described with reference to the accompanying drawing.

5

10

15

20

25

30